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EXAMINER
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ART UNIT	PAPER NUMBER
2135	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>09 April 2007</u>.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-3* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-3* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1.   Claims 1-3 remain for examination.

Response to Arguments

2.   Applicant's arguments with respect to claims 1-3 have been considered but are
moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all
obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

4.   Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over
"Intrusion Detection Using Static Analysis" (hereinafter, "Wagner") in view of "Static
Analysis" (hereinafter, "Webb").

Regarding claim 1:

       Wagner discloses a method for detecting malicious scripts using a static
analysis, comprising the step of: checking whether a series of methods constructing a
malicious code pattern exist and whether parameters and return values associated
between the methods match each other (page 158, 1st paragraph); wherein the
checking step comprises the steps of: classifying, by modeling a malicious behavior in

such a manner that it includes a combination of unit behaviors each of which is composed of sub-unit behaviors or one or more method calls, each unit behavior and method call sentence into a matching rule for defining sentence types to be detected in script codes and a relation rule for defining a relation between patterns matched so that the malicious behavior can be searched by rule variables used in the sentences satisfying the matching rule (section 4.3, "The abstract stack model", and particularly pages 160-161, "The context-free model"); generating instances of the matching rule by searching for code patterns matched with the matching rule from a relevant script code to be detected [i.e., actually implementing the classification step above] (Ibid, and also page 164, "6. Evaluation", 1st paragraph); and generating instances of the relation rule by searching for instances satisfying the relation rule from a set of the generated instances of the matching rule (Ibid).

Wagner does not disclose extracting parameters of functions used in the searched code patterns, and storing the extracted parameters in the rule variables, preferring instead to implement a simpler model. Nevertheless, Webb teaches that the ability to statically analyze "local variables, data structures, and all other data flow" in a script so as to determine if the script is non-hazardous has been long since known in the art, and has even been realized in pre-existing products (the MALPAS system, see page 4/2, and in particular the "Control Flow Analyzer", "Data Use Analyzer", and "Information Flow Analyzer" sections). It would have been quite obvious to one of ordinary skill in the art at the time the invention was made to incorporate at least these elements of Webb's MALPAS system into the static analyzer disclosed by Wagner.

One might be inclined to do so because it would negate the need to make simplistic

assumptions regarding the behavior of the scripts to be tested (see Wagner, page 158,

"4. Models", 2nd paragraph, noting that the conditions assumed to be true can actually

be tested by Webb's "Data Use Analyzer"), and that a suitably modified analyzer would

be useful to verify the correctness of many diverse and/or high integrity applications

(Webb, page 4/3, "5. Static Analysis Experience and Applicability").

Regarding claim 2:

Wagner further discloses wherein the matching rule is composed of rule

identifiers and sentence patterns constructing malicious behavior and having the same

grammar as a language of the scripts to be detected (Figure 2), and wherein the relation

rule comprises conditional expressions in which conditions satisfying the relevant rule

are described, and action expressions in which contents to be executed are described

when the conditions in the conditional expressions are satisfied (Figure 2).

Regarding claim 3:

Wagner further discloses wherein the relation rule includes preconditions that

should be satisfied prior to the conditions in the conditional expressions are described

(page 162, "Principle 1" and subsequent paragraphs), and the action expressions

describe contents that will be executed when both the conditional expressions and

preconditions are satisfied (Fig. 2).

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: U.S. Patents 5,278,901; 5,983,348; 6,697,950; and the papers "Towards a Testbed for Malicious Code Detection" and "Combining Static Analysis and Model Checking for Software Analysis".

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom Gyorfi whose telephone number is (571) 272-3849. The examiner can normally be reached on 8:30am - 5:00pm Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Vu can be reached on (571) 272-3859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TAG
7/3/07

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